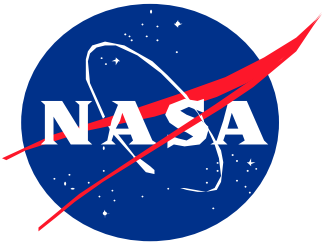# Project Management 101
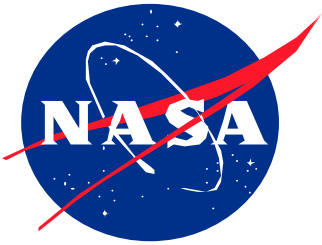# What is Project Management?

Jim Cassidy PMP

NASA Headquarters

Project Management Terms

- Project Management Institute®
  - World wide organization sponsoring project management as a studied discipline
  - 240,000 members
  - http://www.pmi.org/Pages/default.aspx

- Project Management Professional - PMP®
  - Education and experience levels required
  - Application and subsequent permission required
  - 200 multiple choice questions on 4 hour test

- Project Management Body of Knowledge®
 - Currently on 3rd edition, 2004
  - See next slide

Project Management Body of Knowledge - PMBOK®

- The globally accepted standard of project management knowledge

- Five process groups: Initiating, Planning, Executing, Controlling, and Closeout

- Nine knowledge areas: Integration, Scope, Time, Cost, Quality, Human Resources, Communications, Risk, Procurement

- Forty four project management processes that fit into the 5X9 process groups and knowledge areas
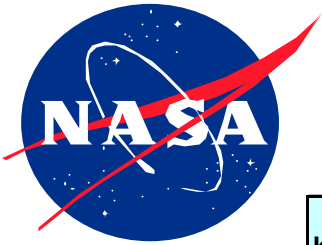
PMBOK Project Mgt Processes

| Process Groups				
Knowledge Area	Initiating	Planning	Executing	Controlling	Closing
---	---	---	---	---	---
Integration	2	1	1	2	1
Scope		3		2	
Time		5		1	
Cost		2		1	
Quality		1	1	1	
Human Resources		1	2	1	
Communications		1	1	2	
Risk		5		1	
Procurement		2	2	1	1

From PMBOK, Third Edition, 2004

4
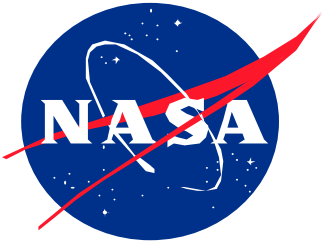
Definition of Project

- The Project Management Institute's definition of a project is:

"A project is a temporary endeavor to create a unique product or service."

- A project exists in a finite time, has a discrete deliverable, and a definable end point
  - Projects have a deliverable and will end, programs will continue on
  - A project team will be disbanded or recycled
  - You may be working a series of time sequenced projects within the overall program
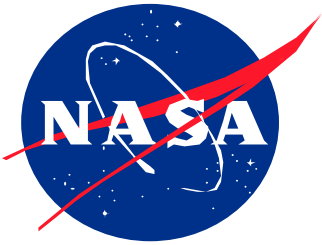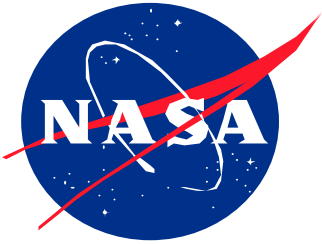
Project Constraints

- All projects are bound by the Triple Constraint of time, cost, and scope while focusing on quality.
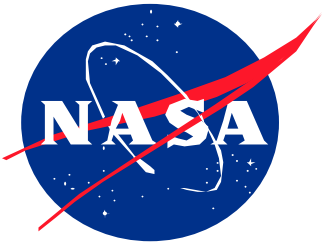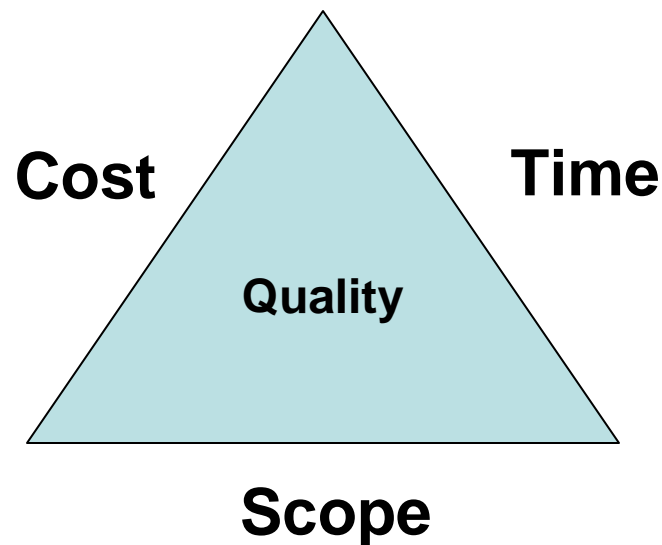

- Think of it as the three legged stool, without one succeeding, the whole collapses

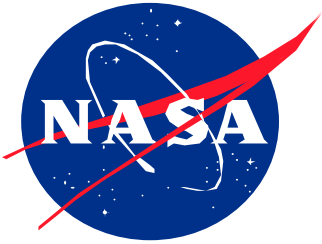# Stakeholders & Customers

- Ensure you have the stakeholders and customers best interest at all times
- Are the stakeholders and customers one and the same? If not, are they in 'lock-sync' together in their needs and wants? If they are not in agreement, what can you do about it?
- How long has this project been under consideration and planning? How is its current health? Is it a good fit for you?

Requirements Definition

- Requirements Definition – specific questions needing answers:
  - What are the objectives of the project and are they clearly articulated?
  - What are the future objectives that the project will produce?
  - Is there a specific cost constraint driven by a cost-benefits study?
  - What FUNCTIONAL requirements need to be addressed?
    - Describe them in plain language
    - Enhance and strengthen understanding with flow charts and graphics
  - What TECHNICAL requirements will satisfy these functional requirements?
    - Technical requirements flow from functional requirements
    - Technical requirements are written for the project technical staff
  - Ensure that the deliverable will meet or exceed the answers to these questions

Requirements Definition

- State requirements explicitly and have customers sign off on it
- Assume and be prepared that requirements will be misinterpreted
- Recognize and plan on there being changes to the requirements and hence the overall project. Then monitor changes and manage them
- Include visual aids with the requirements
  - Graphics
  - Flow charts
  - Wiring diagrams
  - Flip charts
- Educate both the project staff and customers regarding problems of interpretation and specifying requirements
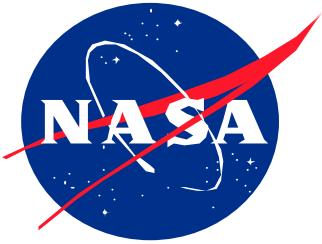
Needs Objectives and Deliverables,

- Seriously consider starting a project with:

  ## "Needs, Objectives, and Deliverables"

  - Identify and list constraints
  - What are, if any, the interrelated projects
  - Who are the customers and stakeholders?
  - How do you define the project deliverable?
  - What is/are the acceptance criteria for the deliverable?
  - How will you know when you are complete?
  - What are the external limitations that are imposed on this project?
  - What cost benefit selection criteria created the need for this project?
 - What are the legal limitations of this project?
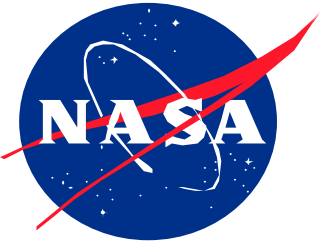
Project Plan

- Always prepare and use the best project plan possible
  - Defines your project for:
    - Relationship to program goals
    - Stakeholders identity
    - Customer buy-in
    - Staff and team members
  - Details the hand-off to operations and maintenance
  - Reference to the balance of project documents: Scope/SOW, risk management plan, configuration control and change process, time sequenced budget and cost limitations, others
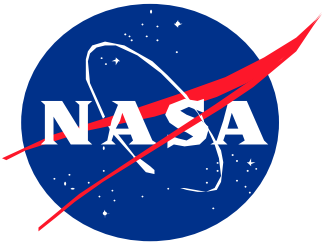
Work Breakdown Structure

- Work Breakdown Structure, WBS
  - The essential, absolutely necessary method of working with a project
    - Breaks the project into (usually) its functional pieces
    - Smallest WBS's are the actionable items, the deliverables
    - Anything above the last WBS are steps along the way
  - A WBS is not the same as a staffing chart
  - The essential tool for:
    - Building a schedule:
      - Performing time sequenced and precursor events
      - Determines critical path
      - Determines slack areas
    - Performing a cost estimate
    - Laying in a baseline for Earned Value Management
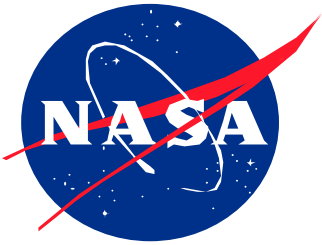   - Visualizing work packages
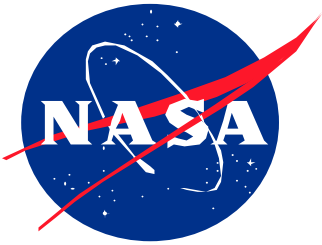
Schedule Analysis & Scope Verification

- Schedule analysis and control
  - Slack/reserve/float, know where it is and jealously guard it
  - Critical path
  - Managing and selling reserve
  - Crashing and fast tracking
    - Methodologies that can shorten schedule duration
    - Will cost the project to employ and often introduces inefficiencies
  - Milestones have no time duration

- Scope verification and management
  - Prevent scope creep and 'gold plating'
  - Should always be WBS oriented
  - When completed and signed of by Stakeholders, it is THE output of scope definition
  - Signed and finalized it becomes a living document and central to configuration control and change boards
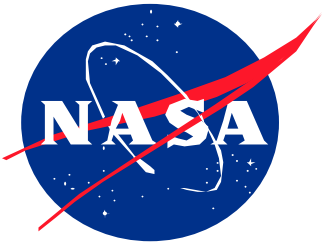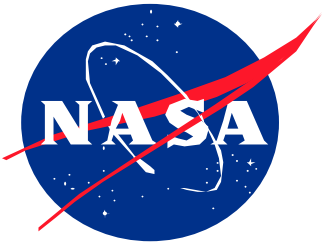
Management Style & Cost Estimating Methodologies

- Management style – know yours
  - Autocratic
  - Participatory
  - Laissez-faire
  - Adopt your natural style to fit the project at hand
    - Difficult to do
    - Need to be adaptive
    - Be prepared for conflicts – possibly your own
  - McGregor's Theory X vs Y
- Cost estimating methodologies
  - Analogous
    - Quick and usually low price
    - Large room for errors
  - Bottoms up or engineering
    - If subject matter is well defined then will likely be very accurate
    - Takes time and can be expensive
  - Parametric
    - Breaks project down to low levels and uses mathematical models
    - Most often used for large and complex projects with numerous unknowns

14

Earned Value Management & Risk Management

- Earned value management – one of the most effective tools a project manager can use
  - Excellent tool for measuring performance
  - Good source of telling you:
    - How efficient/inefficient have you been in the past
    - Excellent predictor of cost and schedule impacts
    - What your Estimate at Completion will be (something very good to know)
- Risk Management
  - Write and use a risk management plan – make it a living document
  - Separate risks from already occurring reality
    - Estimate likelihood of occurrence
    - Estimate impact of occurrence
  - Define the risk mitigating strategy and apply a cost to it. If mitigation is free then employ it.
  - If budget allows, then buy down the risk. If not then accept the risk, and monitor it with the rest of the risks

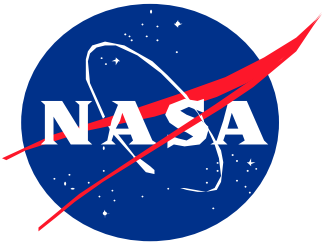# What style of Project Management Office will you use:

- Projectized
  - Efficient project organization
  - Effective communications
  - Usually no home when project completes
  - Duplication of facilities and functions
- Matrix
  - Improved management control over objectives
  - Better coordination
  - Almost always produces more than one boss per staff member
  - Needs extensive management guidance and procedures
- Functional
  - Does not lend itself well to project work
  - Team members report to one manager
  - Project manager can sometimes have no authority
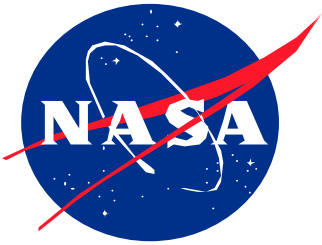 - Staff members have a clearly defined career path
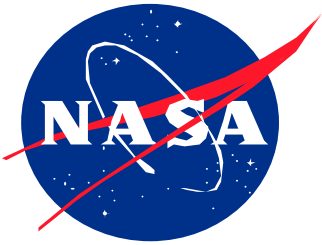
How Did My Project Go Wrong, and How Could I Have Saved My Project?

- **Inadequate stakeholder buy-in**
  - Are the customer and major stakeholder one and the same? Know the difference if they are not.
  - Work on the scope definition document should be incrementally and finally approved by the stakeholder(s)
- **Scope not achievable at cost**
  - If possible re-define scope, cost, and re-orient project
  - If re-definition not possible, salvage what you can
- **Cost estimate bordered on worthless**
  - Did you have a cost estimate? Was it credible?
  - Seat of the pants estimate by technical expert might not really qualify as a cost estimate.
- **Costs escalated out of control**
  - Did you understand and manage the risks?
  - Did the schedule progress commensurate with the cost?
 - Was somebody (you?) "minding the store?

17

How Did My Project Go Wrong, and How Could I Have Saved My Project?

- Started too early – started too late
- Wrong staffing mix
  - Too many staff – or too few
  - Not enough technical leads
  - You inherited staff from somebody else and got stuck with the wrong mix. Need to resolve quickly.
- Natural causes – hurricane, fire, etc.
- Abandoned by program office
  - Program office lost interest
  - Program office getting political pressure to walk away
- Strangled by program office
  - Micro-managers making bad decisions
  - You are forced to accept staff you don't need or want
  - Budget $ not being delivered as promised

18

How Did My Project Go Wrong, and How Could I Have Saved My Project?

- Interrelated technologies failed at promises
  - Make effective use of what you can and carry on, or
  - Stop project completely and shut down
- Interrelated projects couldn't sync with your schedule
  - Re-do your schedule, shuffle resources and move on
  - Force the 'other' projects into your schedule
- Technological breakthrough didn't happen
  - Is it worth proceeding?
  - If so, change scope and cost and move on
- Congress/NASA HQ killed it
- Your project management skills could use some improvement
  - Study up and do better
  - Ask for help
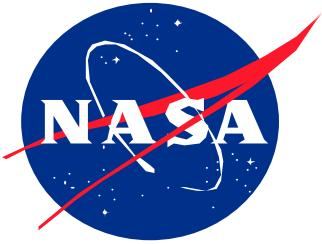
Project Management Proverbs

- At the heart of every large project is a small project trying to get out.
- What you don't know hurts you.
- The bitterness of poor quality lasts long after the sweetness of making a date is forgotten.
- A little risk management saves a lot of fan cleaning.
- The more you plan the luckier you get.
- Everyone asks for a strong project manger - when they get them they don't want them.
- Fast - cheap - good - you can have any two.
- Anything that can be changed will be changed until there is no time left to change anything.
- There is no such thing as scope creep, only scope gallop.
- Activity is not achievement.
- The road to a ruined project is paved with good intentions.